FACTORS AFFECTING THE PERFORMANCE OF SMALL INDIGENOUS CONTRACTORS IN PAPUA NEW GUINEA

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INTRODUCTION

The total area of PNG is 461,690 square kilometres with a total land area of 451,710 square kilometres. The national government owns only 3% of the total land, with 2% privately owned and 95% is traditional owned through clans or kinships. The national government-owned land comprises freehold land, which is only accessible by nationals, and alienated land, which is accessible by nationals and foreigners for development purposes.

Despite 20 years of independence, general construction activity in Papua New Guinea is dominated by large overseas construction companies, mainly from Australia, who undertake major engineering and building construction projects funded by the private and public sector. The large expatriate companies have access to finance, equipment, material and management and technical expertise, which enable them to move around the country to undertake large construction projects. On the other hand, the small indigenous contractors compete for small construction projects within the town or city where they operate and rarely move out to expand their business.

When there is a shortage of work, the large expatriate contractors cover their overheads by competing with the small contractors for small work – a phenomenon termed 'downwards plundering' (ILO, 1987:37). In 1993, the national government, noting that the construction industry could assist in solving the country's employment problem, established the Construction Industry Unit (CIU). This unit comes under the Department of Commerce and Industry and is responsible for working together with the construction. In the same year, the national government, under the National Housing Corporation (NHC) Act No.1 of 1990, also established the NHC, by amalgamating the Department of Housing and the National Housing Commission. The national government then ruled that all construction projects valued up to 100,000 Kina[1] must be undertaken by only small indigenous contractors. From K100,000 to K5 million, projects are reserved for local and PNG based expatriate companies, with projects over K5 million being reserved for joint ventures where the national partner holds over a fifty percent share (Tait and Callick, 1993:165).

Towards the end of 1995, the NHC began its housing construction program and today has built over fifty houses at a cost of K1.2 million. In line with the national government policy to create businesses and employment opportunities for the people of PNG in the construction field, the NHC engages small indigenous contractors for all its infrastructure, maintenance works and housing construction projects throughout the country. All the NHC housing construction projects are carried out under a lump sum contract and open tenders are called for all projects.

The Construction Industry Unit (CIU) contractors' register comprises 150 contractors registered in the country. This includes contractors undertaking engineering, building and specialised work. Out of these, there are 20 large expatriate construction companies, mostly involved in both engineering and building work.

When registering the contractor, their financial status, experience, plant and equipment, experience and personal qualification are taken into consideration. The contractors are then classified

[1] 1 Kina = approx US25c

CONTRACTOR'S CATEGORY	ALLOWABLE RANGE OF CONTRACT COST TO BE CARRIED OUT
Small Category	
Sub-Category A	Equal to or less than K 100,000
Sub-Category B	Equal to or less than K 500,000
Medium Category	
Sub-Category A	Above K 500,000 to K 2,500,000
Sub-Category B	Above K 500,000 to K 5,000,000
Large Category	
Sub-Category A	Above K 500,000 to K 10,000,000
Sub-Category B	Above K 10,000,000

Table 1: Contractor's category and allowable range of contract cost (Source: Construction Industry Unit, 1997).

accordingly as small, medium or large contractors as shown in Table 1 (above).

Registration of contractors is undertaken annually and contractors are assessed again. If the contractor's performance is satisfactory the contractors status in the register is upgraded.

In the PNG capital of Port Moresby, there are a total of 33 contractors registered to undertake building construction work. Large expatriate contractors make up almost a third of those registered. However, it is estimated that the number of registered contractors comprise only 5% of the total number of contractors submitting bids for housing projects.

Small indigenous contractors in PNG face similar problems as small contractors in other developing countries and their performance is thought to be poor. Stretton (1984) has helped identify some problems associated with the poor performance. However, the study did not measure the impact of their problem. The research described in this paper aims to correct this by examining the extent and effect of factors on the performance of small indigenous building construction companies in Port Moresby. Likely factors that affect small indigenous contractors' performance are identified from the literature. An empirical study is then described aimed at determining how these factors affect project cost, time and quality. This comprised a survey by personally administered questionnaires to a sample of small indigenous contractors to assess the level of factors associated with the problem of lack of performance. The view of each firm concerning the effect of each factor on performance was also obtained. The results show that, with the exception of culture, all the factors are perceived to have an effect of construction performance. It is also shown that the incidence of these factors within the firms surveyed are quite low. Of particular concern is the level of cash flow.

PROBLEMS FACED BY SMALL CONTRACTORS: LITERATURE REVIEW

Cash flow

Small contractors in developing countries are often the ones on the fringe of the construction industry and undertake work unwanted by the large contractors. Most of their work, comprising construction, maintenance and refurbishment work, is from the public sector. Consequently, they are likely to be greatly affected by the state of the country's economy because of, for example, changes in the government's expenditure policy (Ruddock, 1992:93). As most government agencies experience financial problems, there are delays of payments to contractors – with a consequent adverse effect on the contractor's cash flow (Ofori, 1991). This then affects the operation of the contractor, ultimately hindering the

projects from being delivered as required (Adam, 1997:445-55; Jannadi, 1997:33).

Many small contractors also experience difficulties in obtaining money from financial institutions to finance their business due to the high levels of bankruptcy in the industry, hence the initial capital for the business must come from the contractor (Miles 1979:86). In addition, most small and medium contractors in developing countries have very limited funds as they are seldom able to offer the necessary fixed assets as collateral (Ofori, 1991:27). Small contractor's therefore operate on very tight budgets, and when they make a loss on one project they tend not to have sufficient resources to continue in business (Stretton, 1984:34-52). Stretton further noted that the success of small indigenous contractors is dependent on the type of contract used - lump sum contracts requiring contractors to have sufficient finances for purchasing materials and paying workers.

In PNG, all public funded projects are let on lump sum contacts with funds only released to contractors for payment of work done. The NHC, being aware of contractors' cash flow problems, make weekly payments to contractors. However, the contractors still experience problems with delay in progress payments. Many small local contractors do not have credit arrangements with major building materials suppliers or financial institutions, and operate on a cash basis. Delays in payment are therefore expected to greatly affect their cash flow.

Construction management skills

Deficiency in planning and management skills is said to be the greatest single problem for small-scale contractors generally (ILO, 1987:47). In developing countries, the local construction industry lacks the capacity and capability of undertaking large construction projects, resulting in the continual domination of expatriate construction companies in undertaking all major construction projects (Adam, 1997:95-108). Consequently, smaller companies find it hard to acquire experience in their type of project (Jannadi, 1997:33) leading to contractors with limited management and technical skills (Ofori, 1991:371-2). This affects their ability to acquire building materials, manage their workers, successfully bid for work (Stretton, 1984:34-52) and generally contributing to poor performance (Ofori, 1991:371-2).

Given the fluctuation in the building industry, employment in the construction industry in third world countries offers less employment security (Stretton, 1984:142). In addition, small contractors in developing countries experience a shortage in skilled labour due to the salary and the security of employment offered by large construction companies being greater than that offered by the small contractor (ILO, 1987:40-3). Furthermore, more young graduates are being assigned to oversee projects and their "lack of skills and experience at both the supervisor and worker level" has been a contributing factor (Lewis, 1984:37-48).

Contract documentation

Inappropriate contract documents has been identified as one of the most common problems affecting the operation of small contractors Ofori (1991:371-2). In developing countries, most public sector clients do not use a standard set of contract documents and building plans. The methods of construction are also different which often confuses the contractors.

In PNG, public housing construction drawings provided by NHC are based on the assumption that the site is flat. Any site work is considered as extras and the contractor can claim for work done. However extra work is not paid for until after practically completed when all extra work is measured and paid out. This places a consequent strain on the contractors' cash flow.

Working relationships

Overall in PNG most small indigenous contractors often do not want a bad working relationship with the client, given that this may jeopardise their chances of getting any further work. Clients are hard to find and easy to lose and a contractor who finishes a contract on time and with a good reputation will be one step ahead of his competitor when the next invitation to tender comes along (Miles, 1980:245). However small indigenous contractors have been known to express disappointment with their working relationship with the client's representative - mainly because of the unsympathetic attitude to the contractor's problems regarding shortage of materials and the delay in payments.

Facilities and equipment

Given the size of their company, many local contractors that are owner managed and operated, run their work from their own residence. Without office equipment like fax and photocopying machines, urgent information or queries take time to reach the parties concerned.

Communication

Communication in small firms is often good, although poor communication skills of the manager can be a problem (Fryer, 1985:65). In developing countries, there is often no means of communication between the workers on site and the contractor's office. Urgent site problems, therefore, cannot be solved immediately because the site workers cannot talk to their manager or owner. In PNG, the NHC site representative can not communicate urgent information to the contractor, thus it has to be relayed through the workers on site. This may lead to information being given to the wrong person or the information being misinterpreted when relayed.

The ILO (1987:43) has further noted that the level of supervision by the client can also affect the performance of the contractor if the client supervisor is not qualified, or there is no effective communication between the contractor and the client. Shortage or the lack of client supervision staff in some developing countries also contributes to the contractor's problem. This may result in the contractor doing remedial work, which can be very costly for small contractors – reducing profit margins and putting a strain on cash flow.

Cultural impact

'Wantokism[2]' is the common cultural problem in PNG and is thought to lead to the downfall of local construction companies. As in all business ventures in PNG that are family owned, members of the family are employed to work for the company. Local building contractors also employ people from their family, the clan and the village. It has been found that, when a contractor employs only relatives, work input is very low when the owner is away from the site (Stretton, 1984:34). Local contractors in PNG are often culturally pressured to employ more of their relatives to maintain a relationship with the village. If the contractors decide otherwise and hire workers from outside the village they are alienated from the village (Stretton, 1984:140).

Financial management skills

Small contractors have very low financial reserves and use the profit from ongoing projects to finance their next project, hence a loss in one project ultimately leads to a cash flow problem and liquidation (Stretton, 1984:43). This is exacerbated by the tendency for small contractors in developing countries to take money out of the business for spending on personal items such as cars or a new house (ILO (1987:40). Most indigenous contractors in PNG are owner operated who also control the company financial matters. It is likely therefore, that project funds will sometimes be channelled into

[2] Onedo (1991:122) defines wantokism or the wantok system as one talk or language, in generic sense this refers to people of the same linguistic, ethic, village, provincial or region.

other personal matters which consequent financial strain to the projects.

In addition, delays in contractor payment caused by the cumbersome process of making contractor payments in the public sector, create financial problems for the contractor. Unless well managed, this delay is very damaging to contractors who are operating in a location remote from the client (Edmonds and Miles, 1984:47).

RESEARCH DESIGN AND METHODOLOGY

All the data required for the study was collected over a one week period in the form of a 'one-shot' or cross-sectional study via a self administered questionnaire (see Appendix A). The questionnaire comprised two parts. The first part contained both structured and unstructured questions concerning general information about the company, relating to the contractor's performance. The second part of the questionnaire contained the factors identified above.

The questionnaire was estimated to take no more then fifteen minutes to complete. The questionnaire was hand delivered to all small indigenous contractors and each was asked to complete the questionnaire by the end of the week, at which time they were then personally collected. The contractors were allowed to answer the questions in their own office and own time and without any pressure being applied on them. Hand delivery and collection of the questionnaire, also afforded the opportunity to answer or clarify any query the contractors had regarding the questions and purpose of the study.

There are 100 small indigenous contractors operating in the National Capital District, where the survey was conducted. This excludes contractors involved in engineering and trade work like painting and electrical and plumbing work. Using stratified random sampling, a total sample of 50 contractors were identified, comprising small indigenous contractors involved in refurbishment, maintenance work, specialist work, engineering and building construction. Questionnaires were then prepared and delivered to small indigenous contractors in Port Moresby experienced in the construction of residential buildings and capable of undertaking project worth up to K100,000 annually. In total, 20 completed questionnaires were returned – representing a response rate of 40%.

ANALYSIS OF RESULTS

Approximately 70% of the respondents obtain work from the public sector, with the remainder securing work from the private sector. A summary of this information regarding the type of work the respondents undertake and their clients is shown in Table 2. All the respondents undertook projects totalling no more than K100,000 pa. Table 3 shows the results for the questions "Extent of item in your company/experienced by your company" and "Effect of item on performance" together with their respective means and standard deviations (SD) for each item. This shows that for the "Extent of item in your company/experienced by your company", with the exception of item 7, all the mean responses are below the mid-point of 3 – indicating that all are, as expected, lower than an average standard. The lowest is 'cash flow, followed by 'communication', 'construction management skills', 'financial skills', 'office facilities', 'contract documentation', and 'level of harmonious relationships'. 'Cultural impact', with a mean of 3.05, was a little higher - as expected.

The results for the question "Effect of item on performance" show that, in contrast with "extent experienced", the mean responses of all items are above the mid-point of 3 – suggesting that all are, as expected, quite highly rated. The highest is 'office facilities', followed by ' financial skills', 'communication', 'cash flow', 'contract documentation', 'harmonious relationships', 'management skills' and 'cultural impact'.

Client	House Construction (%)	Maintenance (%)	Refurbishment (%)	Others (%)
Public	20	53	11	15
Private	35	37	19	9

Table 2: Summary of respondent's source and main areas of work

Item		Experience		Performance	
		Mean	SD	Mean	SD
1	Cash flow	2.05	0.99	3.60	1.14
2	Construction management skills	2.45	1.43	3.30	1.38
3	Contract documentation	2.70	1.21	3.55	0.99
4	Harmonious relationship	2.95	1.09	3.40	0.99
5	Office facilities and equipment	2.60	1.35	4.10	0.71
6	Communication	2.40	1.23	3.80	0.89
7	Cultural impact	3.05	1.70	3.20	1.36
8	Financial management skills	2.50	1.23	4.05	0.60

Table 3: Extent of experience and effect on performance

DISCUSSION

The information provided indicates that most of the small indigenous contractors obtained the majority of their work from the public sector. The predominant area of work is shared between maintenance work and the construction of houses, with some undertaking refurbishment and other trade work.

Performance Factors.

Cash flow

Ranking the least of the factors experienced by the contractors and yet fourth highest in terms of effect, the results confirm that most contractors work with very limited funds, and any delay in payments by the client or when the project funds are mismanaged have an important effect on the contractor's performance.

Management skills

This factor was the third least experienced by the contractors but was considered to have one of the lesser effects on performance. It is noted that most of the small indigenous contractors have established their business through the 'trade route', and should be reasonably proficient in reading plans and undertaking the actual construction work. Clearly, the situation is even worse than expected.

Contract documentation

Rated not too low relative to other factors in terms of extent experienced, this factor is rated fifth in terms of the effect on performance. However, it is noted that most clients, either public or private, often use different contract documents. For public housing, the plans are standard - all being designed for a flat site to enable plans to be used throughout PNG. No site contours are shown on the plans and the contractor is required to inspect the site to allow for any siteworks. Given the lack of information, contractors may increase their estimates for siteworks at the risk of overpricing the work. Most contract conditions put the majority of risk on the contractor. Payments are not made for materials on site unless they are installed, but when operating with minimum funds this affects the contractor's performance.

Working relationships

This is regarded at an average level by respondents and third highest in terms of effect on performance. With almost 70% of their work coming from the public sector, it is necessary for the contractors to maintain a good working relationship with the client to enable them to stand a better chance of getting work in future. Therefore, most contractors may have problems but rarely show them.

Office facilities and equipment

This rates better than the least occurring factors in terms of experience but is the most important in terms of effect on performance. Whilst undertaking the survey, it was noted that most contractors do have office space within their residence. However given that most of the small indigenous construction companies are owner managed, there is no one to attend to administrative work when the owner is out on site. Nor do they keep proper records of the projects that the company has undertaken or is likely to undertake. Most do not have proper office facilities to support their field operation in providing materials and equipment. Given the office locations, there is insufficient space to store materials required for the project, which often results in the materials being bought when required. When this happens, a number of problems arise: the workers on site cannot do any work until the materials are delivered; materials are expensive as they are not bought in bulk; and projects are delayed when materials are not in stock. The unavailability of space means also that most of the contractors prefabricate the work on site. Without any proper working areas and machinery, most of the workmanship in their joinery work is very poor.

Level of communication

As one of the least experienced factors, this is also one of the highest in terms of effect on performance. Being small, most of the communication in the organisation is usually informal, and done verbally to get things done quickly to save cost. However, the problem most small contractors have is the mode of communication between their workers on site and their office or with the owner or manager and the client. Workers on site do not have any means to communicate with their office or the owner or manager. Communication with the owner or manager can only be done when the owner or manager is on site, thus, requests for urgent matters from workers or from the client's site supervisor are often delayed.

Cultural impact

Of all the factors covered, this rated the highest in terms of level experienced but of the lowest effect on performance. This suggests that most of the small indigenous contractors value their culture sufficiently to say that it has a relatively small impact on their performance. It is noted that to be successful in their business the contractors need to be able to combine commercial culture with indigenous culture. This something most businesses in PNG including the construction business have been unable to do very well.

Financial management skills

This is better than the least of the factors experienced and rated highly in terms of the effect on performance. Financial management skills enable the contractor to better manage their finances to enable them to know where and when to spend their money to keep the company operating. Those contractors with financial management skills may have come from the *commercial route* to establish their company or may have taken a book keeping course, hence their ability to manage their finances. However, according to results from the level of cash flow, many contractors have cash flow problems. This could mean that the clients delay payment, or that money is being spent on other things.

CONCLUSION

The analysis interpretations and discussion of the results support the background and observations regarding the reasons for the inadequate performance of small indigenous contractors. They also show that all the factors investigated are perceived to have a significant effect on performance. Equally, it is also shown that the factors are being experienced at poor levels by PNG contractors. Of particular concern is the level of cash flow, which was perceived to be very low by respondents and among the four highest factors affecting performance. Similarly, the level of financial skills, one of the most important factors affecting performance, is among the worst recorded in the firms surveyed. Cultural impact, however, contrary to expectations, is seen to have the least impact on performance.

It is also likely that the factors that affect performance are interrelated and also affect each other. In other words, when there is poor communication between the contractors and the clients site representative, problems associated with the project can not be solved, which would affect their working relationship.

The Pacific Islands group that includes Papua New Guinea is, in several respects, unique among developing countries. Many of the islands have been populated only in the last 500 years. Unlike other post colonial economies, they comprise a fragmented and very diverse population with a relatively weak concept of society. Papua New Guinea, with a population of approximately 4 million people, is by with far the largest of the islands. Together with Lae, Port Moresby, is the primate city of the region, with the largest proportion of urban population and the core of economic and commercial activity. This makes it difficult to generalise the results outside the locality of the study. However, information from NHC Contracts Offices indicated that a majority of small indigenous contractors in the provinces undertaking the NHC projects often experience the same problems as contractors in Port Moresby when undertaking construction of public housing. It is expected, though, that the relevance of the factors that affect performance would differ from those being experienced in Port Moresby. For example, a contractor in Port Moresby experiencing delays in payments would be able to discuss this face- to-face with the client, whilst a contractor outside of Port Moresby has to either spend money calling the client in Port Moresby or just wait until payment is made.

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APPENDIX A

SMALL LOCAL CONTRACTORS PERFORMANCE SURVEY QUESTIONNAIRE FORM (A) Contractor

1.0 GENERAL QUESTION

Please provide suitable answers to the question.

1.1 What approximate percentage (%) of your work is from private and public sector?

Private _____% Public_____%

1.2 Of your private sector projects please estimate approximate percentage?

a) house /building construction _____%
b) maintenance work _____%
c) refurbishment _____%
d) Others _____%

1.3 Of your public sector projects please estimate approximate percentage?

a) house /building construction _____%
b) maintenance work _____%
c) refurbishment _____%
d) Others _____%

1.4 Please indicate the predominant area that you undertook ?

_____

1.3 What is the total value of work your company undertake annually

□ a) up to $ 50,000. □ b) $50,000 to $100,000
□ c) $100,000 to $ 500,000 □ d) over $ 500,000

2.0 PERFORMANCE FACTOR (a) Small Contractor

Please circle where appropriate. It is understood that you may not be able to answer all questions, however your attempt in answering all would be greatly appreciated.

ITEM	EXTENT OF ITEM IN YOUR COMPANY/EXPERIENCED BY YOUR COMPANY					EFFECT OF ITEM ON PERFORMANCE				
	low				high	low				high
1. Level of cash flow	1	2	3	4	5	1	2	3	4	5
2. Level of construction management skills	1	2	3	4	5	1	2	3	4	5
3. Level of sufficient contract documentation	1	2	3	4	5	1	2	3	4	5
4. Level of harmonious working relationship	1	2	3	4	5	1	2	3	4	5
5. Level of office facilities and equipment	1	2	3	4	5	1	2	3	4	5
6. Level of communication within firm & with Principal	1	2	3	4	5	1	2	3	4	5
7. level of cultural impact (Wantok System)	1	2	3	4	5	1	2	3	4	5
8. Level of financial management skills	1	2	3	4	5	1	2	3	4	5

Please indicate others

9. ……. ……. ……..	1	2	3	4	5	1	2	3	4	5
10. …….. ……. …….	1	2	3	4	5	1	2	3	4	5
11. …….. ……. ……..	1	2	3	4	5	1	2	3	4	5